1) When 2 dice are rolled, find the probability of getting a sum of 3.                    1) ___A___

   A) $\dfrac{1}{18}$            B) $\dfrac{33}{36}$            C) $\dfrac{5}{8}$            D) $\dfrac{5}{54}$

   A sum of 3 occurs when 1st die showing 1 and the other showing 2 or vice versa: That is (1,2) or (2,1) out of 36 possible outcomes:  2/36 ⟹ 1/18

2) Cards numbered 1–8 are shuffled and dealt face down. What is the probability that they    2) ___B___
   are in order?

   A) 0.00001240        B) 0.00002480        C) 0.00039683        D) 0.00004960

   They all in order only occurs in one way; the total number of possible arrangements is given by 8!  or 8P8 = 40,320   Prob = 1/40320 => 0.0000248015...

3) The numbers 1 through 8 are written in separate slips of paper, and the slips are placed    3) ___D___
   into a box. Then, 4 of these slips are drawn at random.

   What is the probability that the drawn slips are "1", "2", "3", and "4", in that order?
   A) 0.01428            B) 0.01429            C) 0.34296            D) 0.000595
   Choosing the numbers in that order (1, 2, 3, 4) only occurs in one way. The total number of ways of choosing 4 out of 8, being the order relevant is given
   by 8P4 ==> 1680 ; therefore, the Prob = 1/1680  ==> 0.0005952...

4) A bookcase contains 2 statistics books and 5 biology books. If 2 books are chosen at    4) ___A___
   random, the chance that both are statistics books is _____.

   A) $\dfrac{1}{21}$            B) $\dfrac{10}{21}$            C) $\dfrac{10}{11}$            D) $\dfrac{1}{11}$

   Choosing books in this scenario the order is irrelevant. In how many ways can we choose 2 stat books from a 2 of them available? 2C2 = 1
   The total number of possible outcomes is given by choosing  2 books from a total of 7 ⟹ 7C2 = 21   Prob = 1/21

5) Three statistics professors and seven chemistry professors are available to be advisors to    5) ___B___
   a student organization.  The student organization needs two of the professors to be
   advisors.  If each professor has an equal chance of being selected, what is the probability
   that both professors are chemistry professors?

   A) 0.233            B) 0.467            C) 0.111            D) 0.100

   Order is irrelevant. Choosing 2 Chem prof out of 7 ==> 7C2 =21  Total number of possible outcomes: choosing 2 out of 10 prof in total:  10C2 =45
   Prob = 21/45 = 0.466666....

6) A committee consist of 7 women and 10 men. Three members are chosen as officers.    6) ___C___
   What is the probability that all three officers are women?

   A) 0.1765            B) 0.01163            C) 0.0515            D) 0.0698

   Order is irrelevant. In how many ways can we choose 3 women out of 7 ? => 7C3 = 35; total number of possible outcomes: Choosing 3 out of 17 in total:
   17C3 = 680    Prob = 35/680 = 0.05147...

7) In a company there are 8 executives: 6 women and 2 men. 2 are selected to attend a    7) ___D___
   management seminar. Find the probability that 1 men and 1 woman will be selected.

   A) ≈ 0.0400            B) ≈ 0.0833            C) ≈ 0.2500            D) 0.4286

   Choosing 1 man out of 2 and 1 woman out of 6 ==> 2C1 x 6C1 = 12   Total number of possible selections:  8C2 =28   ==>  Prob = 12/28 = 0.42857 ...

8) A package contains 10 resistors, 2 of which are defective. If 3 are selected, find the    8) ___D___
   probability of getting 1 defective resistor.

   A) ≈ 0.0167            B) ≈ 0.2333            C) ≈ 0.3571            D) ≈ 0.4667

   Notice that if we select 3 and 1 is defective, the other two selected are good ones (there are 8 in good conditions):

   In how many ways can we select 1 defective of 2 and 2 good ones out of 8?  2C1 x 8C2 = 56
   Total number of possible selections:  10C3 = 120

   Prob = 56/120 = 0.466666....

9) A football team consists of 20 freshmen and 20 sophomores, 12 juniors, and 5 seniors.  9)    <u>  D  </u>
Four players are selected at random to serve as captains. Find the probability that there
are 2 sophomores and 2 freshmen.

    A) ≈ 0.3950              B) ≈ 0.2000              C) ≈ 0.0005              D) ≈ 0.0914

In how many ways can we choose 2 sophomores from 20 and 2 freshmen from 20?  $20C2 \times 20C2 = 36100$
The total number of possible selections are 4 out of 57:  $57C4 = 395010$
$Prob = 36100/395010 = 0.091390...$